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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,698

01/05/2006

Shinji Imoto

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EXAMINER

ZIMMERMANN, JOHN P

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

11/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,698	Applicant(s) IMOTO ET AL.	
	Examiner John P. Zimmermann	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>05 JAN 06, 15 FEB 07</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "21 (Figure 2)" and "24 (Specification, Page 16, Lines 3-4)" have both been used to designate "the conveyance unit." Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. Figure 21 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted

by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: #29 (Specification, Page 15, Line 24), #14 (Specification, Page 16, Lines 3-4), and #S7 (Specification, Page 47, Line 21). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1 & 2** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by **Maki et al.**, (US 2002/0126193 A1).

a. As related to independent **claim 1**, Maki et al. teach an image forming apparatus, comprising a head unit having a discharge nozzle for discharging an ink wherein the head unit discharges the ink from the discharge nozzle to print an image on a recording sheet (Maki et al. – Title; Detailed Description, Page 6, Paragraph 131; and Figure 1, Reference #1 & #3, shown below) and a conveyance unit confronting the head unit and conveying the sheet in a movement direction to a position where the sheet confronts the head unit (Maki et al. – Abstract; Detailed Description, Page 7, Paragraph 131; and Figure 1, Reference #8 & #3, shown below).

FIG. 1

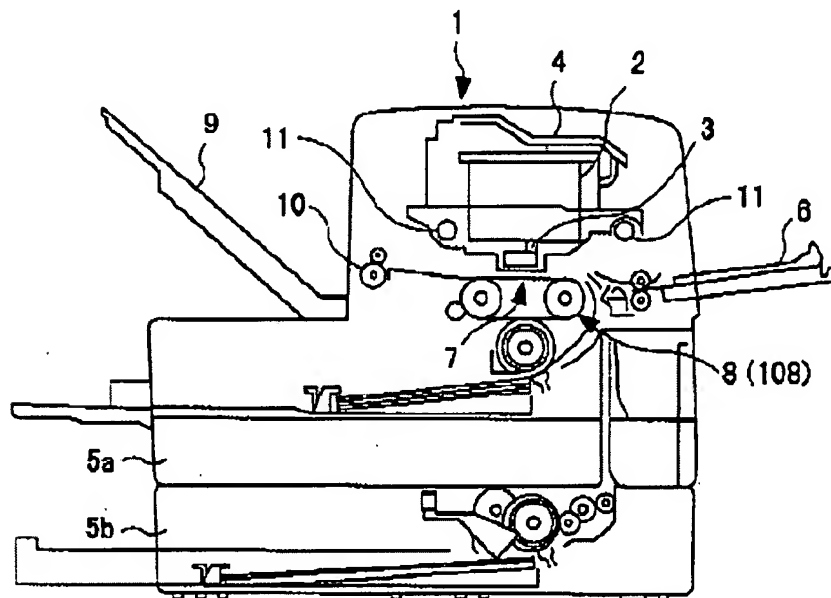
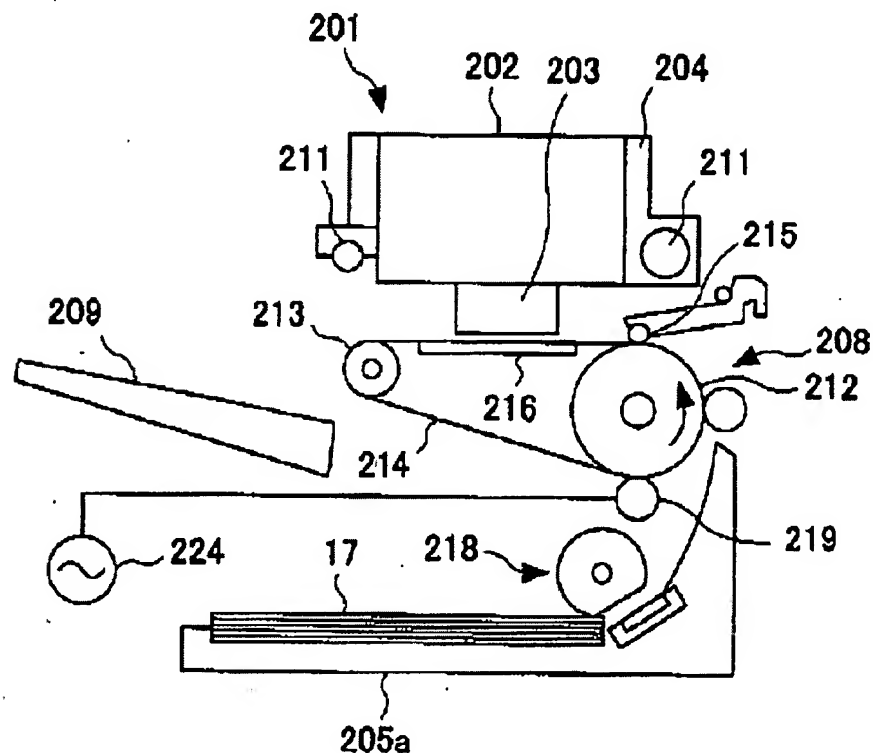


FIG. 18



- c. As related to dependent **claim 2**, Maki et al. teach the charge eliminating unit comprises a conductive member [i.e. a conductive layer and connected to ground] (Maki et al. – Detailed Description, Page 10, Paragraph 153).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

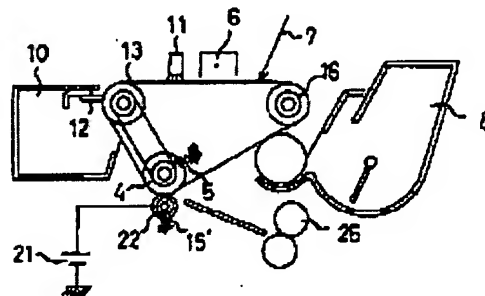
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Maki et al.**, (US 2002/0126193 A1) and further in view of **Tamaki et al.**, (JP 05-224571 A).

Maki et al. teach the limitations of **claim 2** for the reasons above but *do not* specifically teach the charge eliminating unit constituted by a pressure roller. *However*, Tamaki et al. teach a charging or charge eliminating unit constituted by a pressure roller which pushes the recording sheet against the conveyance unit (Tamaki et al. – Detailed Description, Paragraph 23 and Figure 4, Reference #22 & #4, shown below).

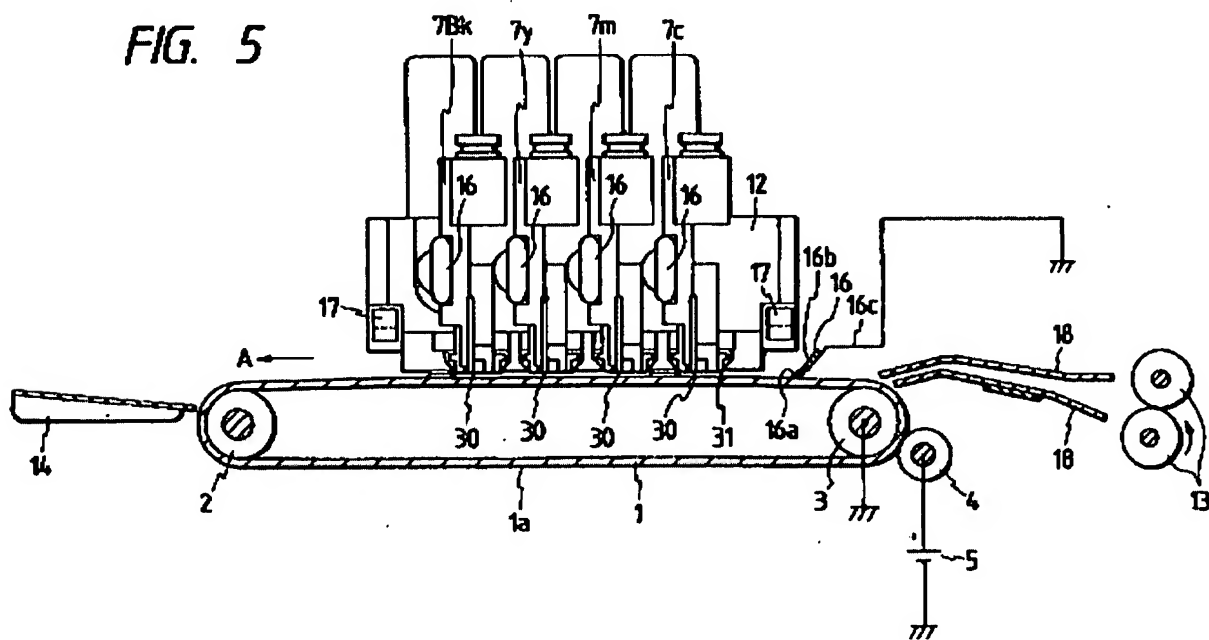
【図4】



Given the same field of endeavor, specifically an image forming apparatus with a conveyance device that includes charging and discharging portions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the image forming apparatus with the charge elimination system as taught by Maki et al. with the specific use of a pressure roller to eliminate the charge on the recording medium, as taught by Tamaki et al. in an effort to provide additional means of holding the recording medium and the belt and the driving roller in constant pressure with each other and thereby eliminate potential curl or cockling (Tamaki et al. – Abstract) while preventing slippage (Maki et al. – Abstract).

11. **Claims 4-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Maki et al.**, (US 2002/0126193 A1) and further in view of **Fukushima et al.**, (US 6,097,408 A).

a. As related to dependent **claim 4**, Maki et al. teach the limitations of **claim 2** for the reasons above but *do not* specifically teach the charge eliminating unit is an electric conduction brush. *However*, Fukushima et al. teach an image forming apparatus [i.e. ink jet recording apparatus] with a charging unit and a charge eliminating unit constituted by an electric conduction brush (Fukushima et al. - Title; Detailed Description, Column 11, Lines 10-15; and Figure 5, Reference #16, shown below).



b. As related to further dependent **claim 5**, the combination of Maki et al. and Fukushima et al. teach the limitations of **claim 4** for the reasons above but *do not* specifically teach the width of the electric conduction brush. *However*, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide an

electric conduction brush with a width that is larger than $(1/2)X$ where X denotes a distance from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit, if for no other reason than to provide a functional charge eliminating brush and given the inherent properties of electrical charges fully eliminate the charge from the conveyance unit.

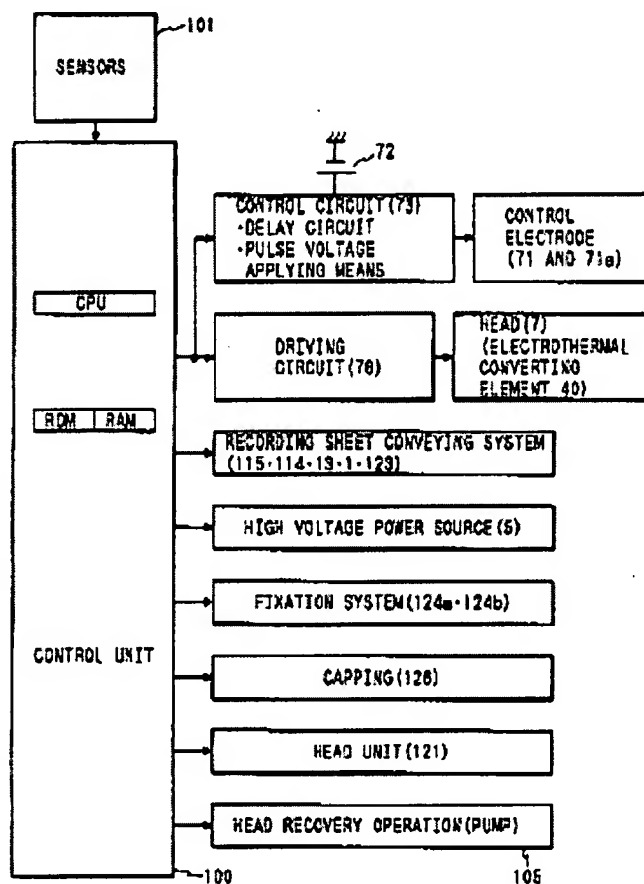
c. As related to dependent **claim 6**, Maki et al. teach the limitations of **claim 1** for the reasons above but *do not* specifically teach a voltage of polarity which is opposite to a charging polarity. *However*, Fukushima et al. teach an image forming apparatus [i.e. ink jet recording apparatus] with a voltage supplying unit [i.e. negative pole of a power source (-)] supplying to the charge eliminating unit [i.e. electrode] a voltage of polarity which is opposite to a charging [i.e. charging roller (+)] polarity of a conveyance belt of the conveyance unit at a position where the conveyance belt confronts the charge eliminating unit (Fukushima et al. - Detailed Description, Columns 5, Lines 53-58, Column 6, Lines 1-3, Column 7, Lines 45-50, and Column 16, Lines 10-15).

d. As related to further dependent **claim 7**, the combination of Maki et al. and Fukushima et al. teach the limitations of **claim 6** for the reasons above but *do not* specifically teach the movement distance of the conveyance unit. *However*, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain a minimum movement distance based on the electrical fields generated on the conveyance unit using the identical or even more accurate equation and the distance from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit, if for no other reason than to enable the conveyance system to move and

attract the recording medium while properly affixing said medium to its' surface before eliminating the charge used for attraction.

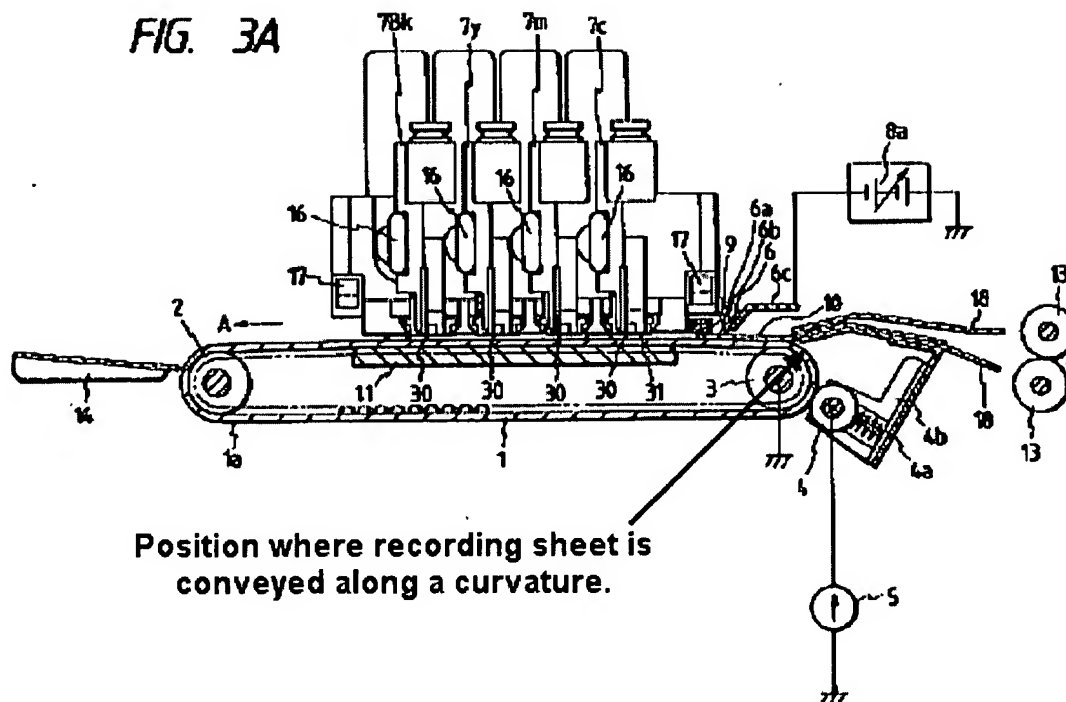
e. As related to further dependent **claim 8**, the combination of Maki et al. and Fukushima et al. teach the limitations of **claim 6** for the reasons above and additionally Fukushima et al. teach a control unit controlling the voltage supplying unit so that no voltage is supplied to the charging unit and the charge eliminating unit when movement of the conveyance unit is stopped (Fukushima et al. – Detailed Description, Column 8, Line 65 - Column 9, Line 3 and Figure 6B, Reference #100, shown below).

FIG. 6B



f. As related to further dependent **claim 9**, the combination of Maki et al. and Fukushima et al. teach the limitations of **claim 6** for the reasons above and additionally Fukushima et al. teach a control unit controlling the voltage supplying unit to vary the voltage supplied to the charge eliminating unit, depending on a kind of the recording sheet (Fukushima et al. – Detailed Description, Column 6, Lines 53-56 and Figure 6B, Reference #100, shown above).

g. As related to dependent **claim 10**, Maki et al. teach the limitations of **claim 1** for the reasons above but *do not* specifically teach the charge eliminating unit disposed downstream of where the recording sheet is conveyed. *However*, Fukushima et al. teach an image forming apparatus [i.e. ink jet recording apparatus] with a charging unit and a charge eliminating unit wherein the conveyance unit comprises a conveyance belt wound around at least two rollers, and the charge eliminating unit is disposed on a downstream side of a position where the recording sheet is conveyed along a curvature of each of said at least two rollers by the conveyance belt, in the movement direction of the conveyance unit (Fukushima et al. – Detailed Description, Column 6, Lines 50-55, Column 7 Lines 35-50 and Figure 2, Reference #A, #1, #2, #3, #6 and Arrows, shown below).



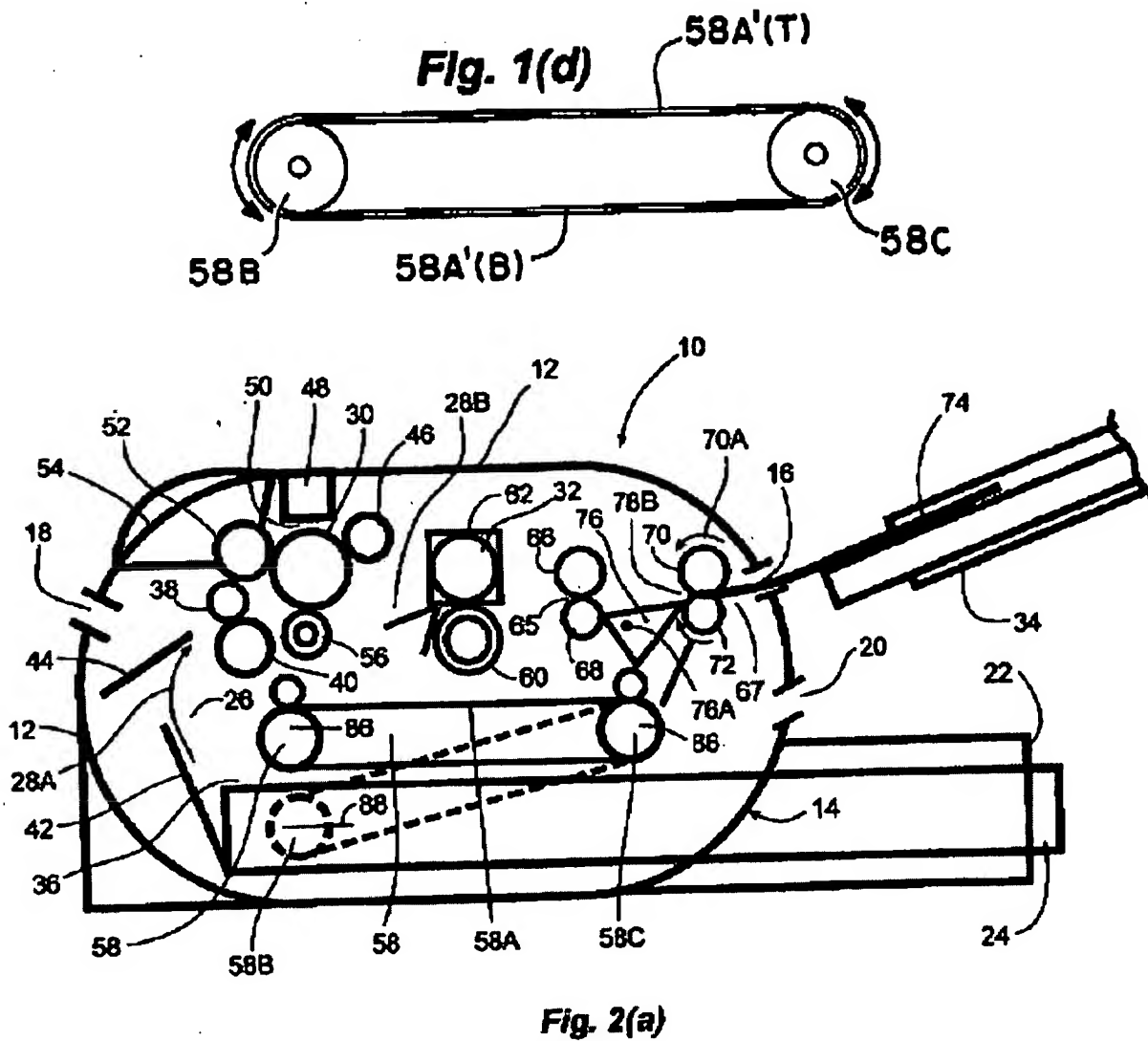
h. As related to dependent **claim 11**, Maki et al. teach the limitations of **claim 1** for the reasons above and while Maki et al. teaches the charge eliminating unit is disposed in close proximity to the head unit (Maki et al. – Figure 18, Reference #203 & #212, shown previously), Fukushima et al. teach a position almost identical to the position detailed by the present application in the specifications and drawings, that being a position near the head unit (Fukushima et al. – Figure 3A, Reference #6, shown above).

Given the same field of endeavor, specifically an ink jet recording apparatus with a conveyance device that includes charging and discharging portions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the image forming apparatus with the charge elimination system and the specific layout thereof as taught by Maki et al. with the specific use of a electric

conduction brush to eliminate the charge on the recording medium, a controlling unit, and the specific layout thereof as taught by Fukushima et al. in an effort to provide additional means charge elimination, while producing a high quality recording and preventing defective ink discharging even though static electricity is utilized for attracting and holding the recording medium (Fukushima et al. – Summary, Column 3-4). While Fukushima et al. shows all specific examples using Direct Current (DC) further motivation to combine is easily obtained by referencing Fukushima et al. and the acknowledgment of the use of Alternating Current (AC) in lieu of DC, whereby the principles remain the same (Maki et al. – Detailed Description, Column 7, Lines 35-37 and Column 16, Lines 29-32).

12. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Maki et al.**, (US 2002/0126193 A1) and **Fukushima et al.**, (US 6,097,408 A) as applied to **claim 11** above, and in further view of **Eskey** (US 6,909,872 B2) and **Kashiwagi et al.** (US 2001/0028381 A1).

The previous combination of Maki et al. and Fukushima et al. remains as applied above. The combination *does not* specifically teach a sheet reversing unit with a sheet separating unit. *However*, Eskey teaches an image forming apparatus with a sheet reversing unit reversing the recording sheet and a sheet separating unit (Eskey – Detailed Description, Column 7, Lines 1-57 and Figure 2(a), Reference #76, shown below) for use when the conveyance unit is reversely rotated to convey the recording sheet (Eskey – Figure 1(d), Reference #58A' and Arrows, shown below) after the image is printed on the printing surface of the recording sheet, to the sheet reversing unit (Eskey – Summary, Columns 1-2).



Continuing with **claim 12**, Kashiwagi et al. specifically teaches multiple charging and discharging sections (Kashiwagi et al. – Figure 8, Reference #3, #21, #26, & #81, shown below) and the process of separating the charge eliminating unit from the recording sheet depending on the recording stage of the apparatus (Kashiwagi et al. – Detailed Description, Page 14, Paragraphs 206-210 and Figures 16 & 17, shown below).

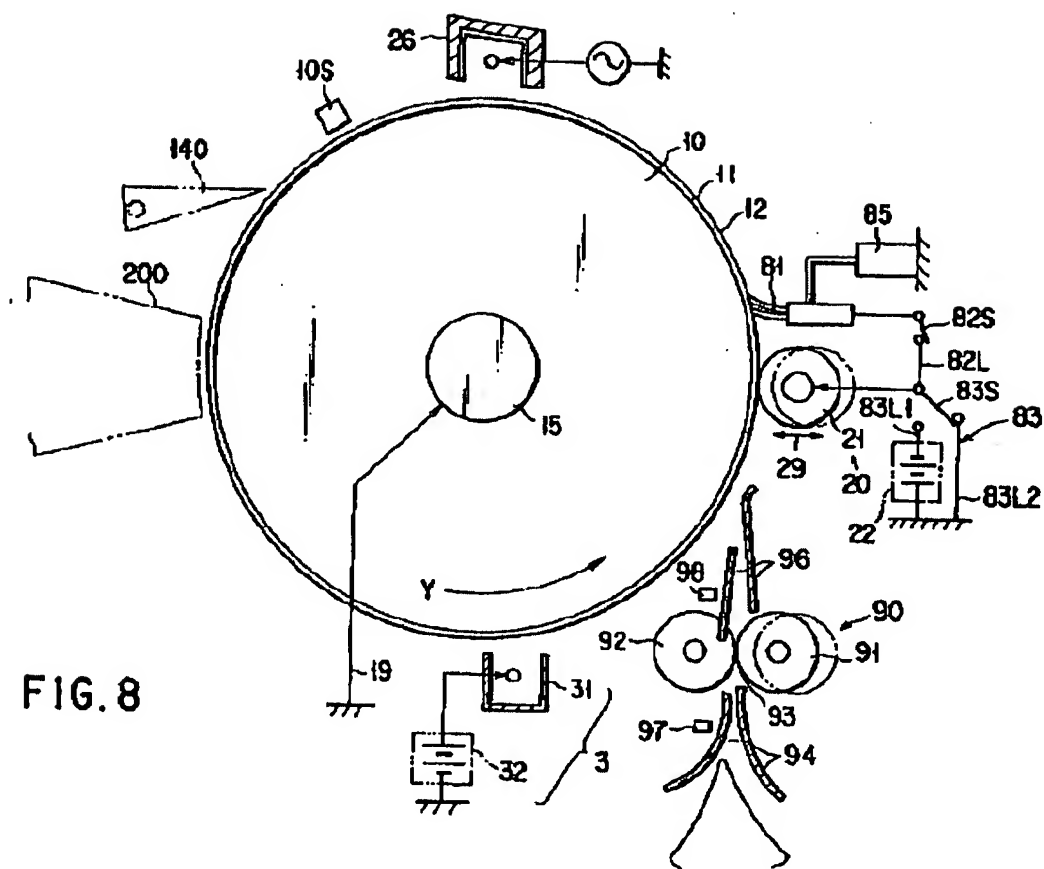


FIG. 16

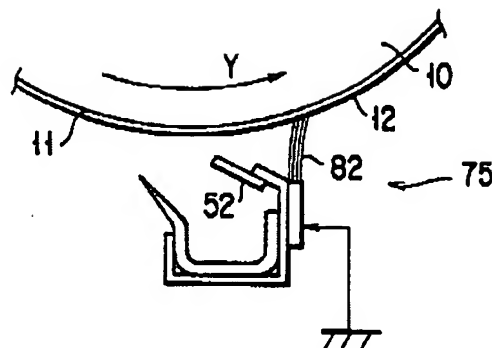
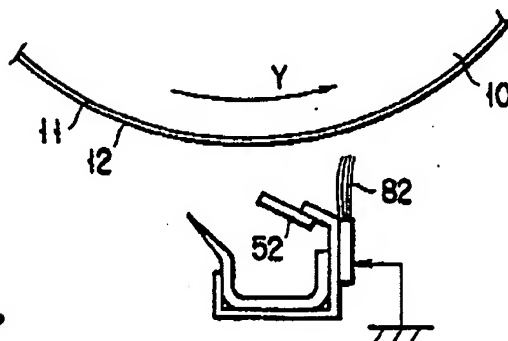


FIG. 17



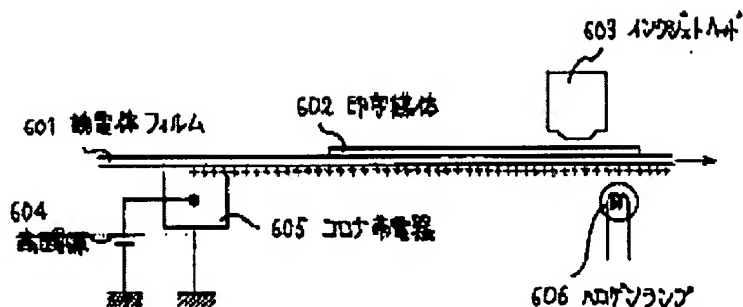
Given the same field of endeavor, specifically a ink jet recording apparatus with a conveyance system that includes various portions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the image forming apparatus with the charge elimination system and the specific layout thereof as taught by the combination of Maki et al. and Fukushima et al. with the specific use of a sheet reversing unit with a sheet separating unit and a reversible conveyance system as taught by Eskey and the separation of the charge eliminating unit from the recording sheet depending on the recording stage of the apparatus as taught by Kashiwagi et al. in an effort to provide a multipath printing apparatus with first and second flow direction of the recording medium (Eskey – Title and Abstract) and provide optional

control of the charging and elimination of the charge from the various surfaces of the conveyance means and recording medium (Kashiwagi et al. – Detailed Description, Page 14, Paragraphs 202-209) an reliably and securely hold the print medium to the conveyance means without a complicated structure (Kashiwagi et al. – Summary, Paragraph 8).

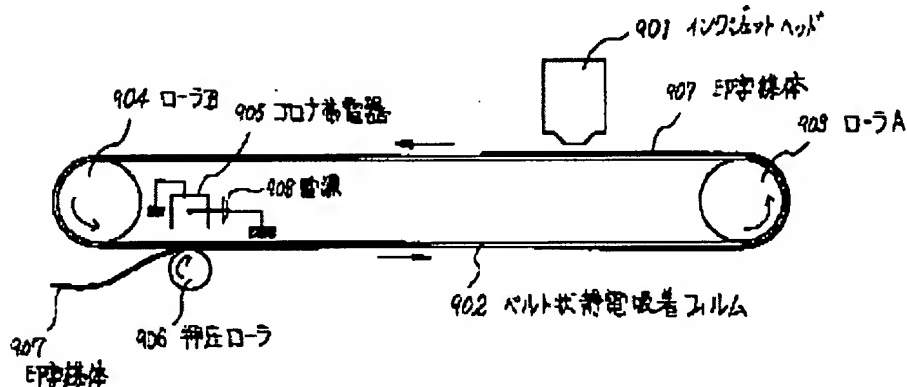
12. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Maki et al.**, (US 2002/0126193 A1) and further in view of **Kawada et al.**, (JP 09-254460 A).

Maki et al. teach the limitations of **claim 1** for the reasons above but *do not* specifically teach a heating unit heating the recording sheet. *However*, Kawada et al. teach transferring print medium using electrostatic attraction and a heating unit (Kawada et al. – Abstract and Figure 6, Reference #606, shown below) disposed upstream of the charge eliminating unit (Kawada et al. – Figure 9, Reference #908, shown below) in the movement direction of the conveyance unit.

【図6】



【図9】



Given the same field of endeavor, specifically an ink jet recording apparatus with a conveyance device that includes charging and discharging portions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the image forming apparatus with the charge elimination system as taught by Maki et al. with a means to heat the recording medium, thereby enhancing the attraction characteristics of the electrical charge, particularly the specific use of a heating unit disposed therein as taught by Kawada et al. in an effort to provide additional means of enhancing the attraction of the print medium (Kwada et al. – Abstract).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Silverberg (US 3,717,801 A) teaches an AC tacking operation for a conveyance means. Bannai et al. (US 5,121,170 A) teach an AC charged belt attached to a roller for transporting a recording sheet. Matsumoto (US 2002/0021312 A1) teaches a power feeding brush imparting an adsorption force to a conveying belt and a charge removing brush. Kitajima et al. (US 2002/0044189 A1) teach a charging roller which is a pressing roller in an image forming apparatus. Kamiya (US 7,245,863 B2) teaches registration rollers in a conveyance portion of a printing apparatus which may be grounded or biased or charged.

14. ***Examiner's Note:*** Examiner has cited particular Figures & Reference Numbers, Columns, Paragraphs and Line Numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is 571-270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

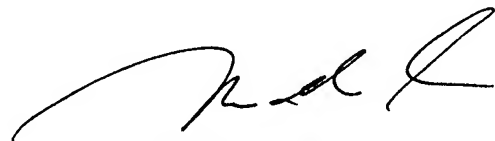
Application/Control Number:
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Art Unit: 2861

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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MATTHEW LUU
SUPERVISORY PATENT EXAMINER